



The Damocles Malthusian sword

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Demand for food constant increases, according to the growth in population and income. These levels of consumption, never occurred in the past, projecting the world to unknown scenarios, soon called to have to test the validity of the law of Malthus and its consequences. While there are questions on the supply side capabilities to meet the demand instances, agriculture becomes the main factor of development of the economy. This leads us to outline the main developmental patterns of food consumption, increasingly exercising their influence over the entire planet.

Are T. R. Malthus (1766-1834) and C. Darwin (1809-82), a little over a century ago, to predict the actuality. The link between food demand and the population is under investigation in the "*Essay on the Principle of Population and its effects on the future development of society*" (Malthus, 1789).

The identification of biological law identifies the limit of multiplication of living beings in natural resources; population growth is exponential but cannot be unlimited (vertical dimension).

The innovative element is the current demographic explosion, with the resulting questions about the saturation boundary of the planet, the potential of food supply, legitimacy and sustainability of such an evolutionary model.

Is Darwin, in "*The Origin of Species*" (1859), that gives a final shove to the alleged superiority of 'man, discovering as well as our fate is governed by the biological law, the Copernican mine opposed to the certainties of anthropocentric subjectivism, investigating life as a biological system (horizontal dimension).

Man confirms his characters of invasiveness, insatiability, implacability, even with respect to his own. The departure from the biological equilibrium is definitive. The anthropogenic impact does not leave no way, for other species survival becomes a function of consumption utility, productivity, selection. The disappearance of flora and fauna pays an increase in the value of the soil, increasingly scarce. The question on the limit of existence renew philosophical, anthropological, metaphysical speculations, with the rapid decline of the marginal utility of an overcrowded world, the progressive competition for food and resources, the myth of Icarus is renewed.

Consumption rivalry implies, not least, the growth of individuals at the margins, devoid of resources, and those of the costs, to the diminishing of production factors employable. The number of individuals is inversely proportional to the survival value (Darwin), the demographic explosion results in the negativity of its marginal utility, and to the advancement of biological imbalance, the environmental limitation is undeniable.

The reference variable becomes food demand, that is, the set of products used to meet nutritional needs. Its expansion is a function of the population and per capita consumption.

In developed countries, population growth is relatively modest, as is per capita consumption. In contrast, in the other, the demographic explosion, in spite of a still-restrained per capita consumption, prefigures the impact of potential demand, also in terms of increasing life expectancy and tonnage of population.

Demand evolves due to the change in income and price. As the income grows, the expenditure changes, those for nutrition, even though increasing, but decreases relative relevance (Engel's law).

In a growing society, consumption in final calories increases with income and tends to a limit. The initial calorie expenditure, however, continues to increase, to replace those vegetables with animals. Higher revenues modify the structure of food consumption, with an increase in spending more than proportional to the quantity, whose average price is growing. Thus, animal, agro-industrial (i.e. transformed) calories, processed products, replace agricultural crops.

In the more mature economies, the high-energy food model is dominated by a large proportion of animal calories, agro-industrial sophistication, significant losses along the agro-food chain.

The satiety society is identified as a growing demand for farm produce for livestock (corn, soy, substitute products), the main outlet of the productions.

Low-income countries, on the other hand, have a demand mainly for plant products, the most important source of nutrition. The convergence of food models imitating the more advanced countries, however, exacerbates the consumption of animal protein. By conditioning the international trade flows of agricultural products.

Regarding the price, demand for agricultural products is relatively inelastic, with the amount that does not change proportionally to variation of the price. In particular, this applies to direct elasticity, especially in the short term. Under these conditions, agricultural markets tend to be characterized by volatile prices, with the price variation being greater than that of the quantity.

In the longer term, demand has a greater elasticity, even in the presence of substitutes.

It is the cross-linked elasticity that measures the relative variation of demand for a good compared to that of another's price, distinguishing them in substitutes and complements goods.

The cross-linked elasticity tends to assume higher values as consumers more easily modify their choices between goods at the variations of the relative prices.

In farming sector, an increase in the price of soybeans induces preferences to other agricultural commodities, such as corn, sunflower, cassava and other substitutes.

From all this, the global demand for agricultural products appears exponentially growing, both effect of population growth, both in the increased demand for new sectors, such as energy, primarily due to the overall increase in income. It also presents the characteristics of stiffness and urgency, uncompressible and urgent.

The impact of demand is reflected on prices, representing the varied evolution of endogenous as exogenous variables. The endogenous inherent specific problems of supply, cultivation techniques, innovative elements (biotechnology, OGM). In the exogenous variables fall market dynamics, substitute products, energy prices, currency exchange rates, speculation on commodities, economic policies.

Empirical evidence shows that, after a past decline, the prices of the agricultural products present an uptrend to a set of causes. The stock variations become a significant evolutionary variable of price expectations. In their contraction, there is an increase in systemic risk.

Strong is the correlation with the price courses of the energy sources, with the substitution relationships between the markets extremely binding.

The increase in the price of energy affects the market of cereals and protein and, therefore, the whole agricultural sector.

This intensifies the action of financial operators, translating in to greater price volatility.

Speculation attests to the renewed interest in agricultural commodities, while the energy policies based on renewable resources create new expectations of rising prices.

The effects are varied and are not confined to the agricultural sector, covering more and more political and social importance. Thus, the phenomenon of "Land Grabbing" from many States and multinational companies especially in Africa, aims to actualize and prospects profits, with the destabilization of local socio-economic traditions and implying serious risk for unique natural environments.

The changed trend of agricultural prices entail the unsustainability of the economy of the poorest countries, with a precarious political balance, in which the living conditions rapidly deteriorate.

Market evolution threatens the sustainability of large sections of a population already dangerously excessive.

The North Africa shows the most critical elements. The failure of socio-cultural adaptation, steeped in ancestral and archaic elements, the most favorable health conditions results in emergency demographic situations: the average age is lower to fifteen years, but it's coming to ten.

An army of more than half a billion children self-replicating, prey to any form of solicitation, in a degenerative spiral that allows no escape routes.

Is utopic that the other people, who actually pay the consequences, will bear the heavy duty of such a procreative frenzy, disconnected from assumptions of responsibility, like the awareness of having to bring the baby into a socio-economic-cultural context suitable for its human development and realization.

In this situation are very difficult, but urgent, demographic policies focusing on a sustainable human development.

Growing masses of young people are poured into richer areas, unable to contain the hordes which are without rules and laws, imposing their own survival models centered on self-violence in a spiral of anthropological involution.

This are aberration processes linked to overpopulation.

However, the situation does not appear lighter to a global look, so the Asiatic people, present everywhere, representing more than 60% of the inhabitants of the planet, since the end of World War II are more than tripled. Grown in China and India, only in the last decade of 20%, respectively to 1.4 and 1.3 billion. Here, the traditional food consumption structure is gradually replaced by new styles, an unquenchable thirst for milk, meat, cheese and eggs gradually conveys the flow of world trade in commodities.

But even Hispanics, Africans, and mestizos have just embarked upon their demographic path.

Globally, with eight billion people, adapting to the consumption structure of the advanced countries is untenable.

From the theoretical point of view, in the understanding of current and prospective outcomes dynamics requires the contribution of information asymmetry, the corollary of which is the adverse selection.

The functional specialization of postmodern society creates the conditions for which for a large share of population the act of food consumption is completely unconnected with its production.

With the urban concentration of individuals, for whose exclusive goal becomes maximizing consumer utility, loses importance the meaning and relevance of the food chain, as well as the perception of relative scarcity.

Compelling price-calming policies that avoid problems with population, whose motivation factors are identified in procreation and food consumption. Freedom of choice is relegated to the supermarket shelf.

The earth is being transformed into an enormous food factory. In this situation, the overweight individuals and obese are three times (2,2 billion, 30% of the population) then malnourished.

While systematically failure the responsive and sustainable consumption and awareness-raising campaigns. At the same time, it creates an irreparable tear between the behavior of the individual and the common good, which would impose the demographic adjustment to the limits of the globe.

In a similar evolutionary pattern, it becomes relevant the question if there is the chance of adapting to the eventual manifestation of scarcity, or if it appears, sooner or later, unavoidable.

The emergence of an excess of marginal demand could have direct effects on prices. Some shock factor (environmental, health, war, etc.) could result in famine phenomena.

In such situation, long-term processes will have to deal with the urgent need of large quantities of food. Supply will not meet the needs of demand.